

Application No.: 09/716,154

No.: CX098007-C01/BCS03324  
(PATENT)**AMENDMENTS TO THE CLAIMS**

1. (Currently amended) A method for performing initial ranging in conjunction with a contention-based Medium Access Control (MAC) protocol in a shared-medium communication network, the method comprising the steps of:  
taking a first system performance measurement to obtain a first probability of success outcomes using a first backoff window size;  
taking a second system performance measurement to obtain a second, probability of success outcomes using a second backoff window size different than the first backoff window size; and  
determining a third backoff window size based on the first and second system performance measurements, wherein the step of taking the first system performance measurement comprises:  
providing ranging opportunities and specifying the first backoff window size for collision resolution;  
counting a first number of success outcomes in a first sample of N ranging opportunity slots; and  
determining the first probability of success outcomes equal to the first number of success outcomes divided by N; and  
the step of taking the second system performance measurement comprises:  
providing additional ranging opportunities and specifying the second backoff window size for collision resolution;  
skipping a number of ranging opportunity slots at least equal to the first backoff window size;

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counting a second number of success outcomes in a second sample of N ranging opportunity slots; and

determining the second probability of success outcomes equal to the second number of success outcomes divided by N; and

wherein the step of determining the third backoff window size comprises:

determining a ratio R having a numerator equal to the second probability of success outcomes minus the first probability of success outcomes and a denominator equal to the second backoff window size minus the first backoff window size;

setting the third backoff window size greater than the second backoff window size, if the ratio R is a positive value; and

setting the third backoff window size less than the second backoff window size, if the ratio R is a negative value, and wherein

the step of setting the third backoff window size greater than the second backoff window size comprises setting the third backoff window size equal to twice the second backoff window size; and

the step of setting the third backoff window size less than the second backoff window size comprises setting the third backoff window size equal to half the second backoff window size.

2. Cancelled.
3. (Currently amended) The method of claim [[2]] 1 wherein N is a predetermined sample size equal to twenty (20) ranging opportunity slots. .
4. Cancelled.
5. Cancelled.

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6. (Currently amended) The method of claim [[2]] 1 wherein the step of taking the second system performance measurement further comprises:  
counting a number of garbled outcomes in the second sample of N ranging opportunity slots; and  
determining a probability of garbled outcomes equal to the number of garbled outcomes divided by N.
7. (Original) The method of claim 6 wherein the step of determining the third backoff window size comprises:  
determining a ratio R having a numerator equal to the second probability of success outcomes minus the first probability of success outcomes and a denominator equal to the second backoff window size minus the first backoff window size;  
setting the third backoff window size greater than the second backoff window size, if either:  
the ratio R is greater than or equal to zero, and the probability of garbled outcomes is greater than 0.3; or  
the probability of garbled outcomes is greater than 0.8; and  
setting the third backoff window size less than the second backoff window size otherwise.
8. Cancelled.
9. (Original) The method of claim 1 wherein the MAC protocol is a Multimedia Cable Network System (MCNS) protocol.
10. (Currently amended) An apparatus comprising a computer usable medium having embodied therein a computer readable program for performing initial ranging in conjunction with a contention-based Medium Access Control (MAC) protocol in a shared-medium communication network, the computer readable program comprising computer readable program instructions enabling a computer to perform the steps of:

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taking a first system performance measurement to obtain a first probability of success outcomes  
using a first backoff window size;

taking a second system performance measurement to obtain a second probability of success  
outcomes using a second backoff window size different than the first backoff window  
size; and

determining a third backoff window size based on the first and second system performance  
measurements, wherein the step of taking the first system performance measurement  
comprises:

providing ranging opportunities and specifying the first backoff window size for  
collision resolution;

counting a first number of success outcomes in a first sample of N ranging  
opportunity slots; and

determining the first probability of success outcomes equal to the first number of  
success outcomes divided by N; and

the step of taking the second system performance measurement comprises:

providing additional ranging opportunities and specifying the second  
backoff window size for collision resolution;

skipping a number of ranging opportunity slots at least equal to the first  
backoff window size;

counting a second number of success outcomes in a second sample of N  
ranging opportunity slots; and

determining the second probability of success outcomes equal to the  
second number of success outcomes divided by N; and wherein the step of  
determining the third backoff window size comprises:

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determining a ratio R having a numerator equal to the second probability of success outcomes minus the first probability of success outcomes and a denominator equal to the second backoff window size minus the first backoff window size;

setting the third backoff window size greater than the second backoff window size, if the ratio R is a positive value; and

setting the third backoff window size less than the second backoff window size, if the ratio R is a negative value, and wherein the step of setting the third backoff window size greater than the second backoff window size comprises setting the third backoff window size equal to twice the second backoff window size; and

the step of setting the third backoff window size less than the second backoff window size comprises setting the third backoff window size equal to half the second backoff window size.

11. Cancelled.
12. (Currently amended) The apparatus of claim [[11]] 10 wherein N is a predetermined sample size equal to twenty (20) ranging opportunity slots.
13. Cancelled.
14. Cancelled.
15. (Currently amended) The apparatus of claim [[11]] 10 wherein the step of taking the second system performance measurement further comprises:  
counting a number of garbled outcomes in the second sample of N ranging opportunity slots; and  
determining a probability of garbled outcomes equal to the number of garbled outcomes divided by N.

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16. (Original) The apparatus of claim 15 wherein the step of determining the third backoff window size comprises:

determining a ratio  $R$  having a numerator equal to the second probability of success outcomes minus the first probability of success outcomes and a denominator equal to the second backoff window size minus the first backoff window size;

setting the third backoff window size greater than the second backoff window size, if either: the ratio  $R$  is greater than or equal to zero, and the probability of garbled outcomes is greater than 0.3; or

the probability of garbled outcomes is greater than 0.8; and

setting the third backoff window size less than the second backoff window size otherwise.

17. Cancelled.

18. (Original) The apparatus of claim 10 wherein the MAC protocol is a Multimedia Cable Network System (MCNS) protocol.

19. Cancelled.

20. (Currently amended) A data signal embodied in a carrier wave, wherein embodied in the data signal is a computer readable program for performing initial ranging in conjunction with a contention-based Medium Access Control (MAC) protocol in a shared-medium communication network, the computer readable program comprising computer readable program instructions enabling a computer to perform the steps of:

taking a first system performance measurement to obtain a first probability of success outcomes using a first backoff window size;

taking a second system performance measurement to obtain a second probability of success outcomes using a second backoff window size different than the first backoff window size; and

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determining a third backoff window size based on the first and second system performance measurements, wherein the step of taking the first system performance measurement comprises:

- providing ranging opportunities and specifying the first backoff window size for collision resolution;
- counting a first number of success outcomes in a first sample of N ranging opportunity slots; and
- determining the first probability of success outcomes equal to the first number of success outcomes divided by N; and

the step of taking the second system performance measurement comprises:

- providing additional ranging opportunities and specifying the second backoff window size for collision resolution;
- skipping a number of ranging opportunity slots at least equal to the first backoff window size;
- counting a second number of success outcomes in a second sample of N ranging opportunity slots; and
- determining the second probability of success outcomes equal to the second number of success outcomes divided by N, and wherein the step of determining the third backoff window size comprises:

- determining a ratio R having a numerator equal to the second probability of success outcomes minus the first probability of success outcomes and a denominator equal to the second backoff window size minus the first backoff window size;
- setting the third backoff window size greater than the second backoff window size, if the ratio R is a positive value; and

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setting the third backoff window size less than the second backoff window size, if the ratio R is a negative value, and wherein the step of setting the third backoff window size greater than the second backoff window size comprises setting the third backoff window size equal to twice the second backoff window size; and

the step of setting the third backoff window size less than the second backoff window size comprises setting the third backoff window size equal to half the second backoff window size.

21. Cancelled.
22. (Currently amended) The data signal of claim [[21]] 20 wherein N is a predetermined sample size equal to twenty (20) ranging opportunity slots.
23. Cancelled.
24. Cancelled.
25. (Currently amended) The data signal of claim [[21]] 20 wherein the step of taking the second system performance measurement further comprises:  
counting a number of garbled outcomes in the second sample of N ranging opportunity slots; and  
determining a probability of garbled outcomes equal to the number of garbled outcomes divided by N.
26. (Original) The data signal of claim 25 wherein the step of determining the third backoff window size comprises:  
determining a ratio R having a numerator equal to the second probability of success outcomes minus the first probability of success outcomes and a denominator equal to the second backoff window size minus the first backoff window size;  
setting the third backoff window size greater than the second-backoff window size, if either:



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the ratio  $R$  is greater than or equal to zero, and the probability of garbled outcomes is greater than 0.3; or

the probability of garbled outcomes is greater than 0.8; and

setting the third backoff window size less than the second backoff window size otherwise.

27. Cancelled.

28. (Original) The data signal of claim 20 wherein the MAC protocol is a Multimedia Cable Network System (MCNS) protocol.

29-35. Cancelled.